AMENDMENTS

In the Claims:

Please **amend** the pending claims by substituting the following:

Claim 1 (previously presented) A waveform data analysis method comprising:

a step of designating a waveform type from among a plurality of waveform types, said plurality of waveform types including at least a sustain-sound-related waveform type and a percussion-sound-related waveform type;

a step of selecting a parameter to be used in a filter process, said parameter being selected in accordance with the waveform type designated by said step of designating;

a step of performing a filter process for removing, from an original waveform data, a predetermined frequency component, said filter process being performed by use of the parameter selected by said step of selecting; and

a step of determining dividing positions of the original waveform data on the basis of envelope levels of the waveform data having been subjected to said filter process.

Claim 2 (previously presented) A waveform data analysis method as claimed in claim 1 wherein the dividing positions determined by said step of determining are set as the waveform data control points.

Claim 3 (previously presented) A waveform data analysis method comprising:

a step of performing a filter process for removing components of a predetermined frequency band from original waveform data;

a step of detecting an envelope of the waveform data having been subjected to the filter process;

a step of performing an amplitude conversion process on the envelope for reducing an amplitude difference in the envelope; and

a step of determining dividing positions of the original waveform data on the basis of a differentiated result of the envelope having been subjected to the amplitude conversion process.

Claim 4 (original) A waveform data analysis method as claimed in claim 3 which further comprises an amplitude conversion step of reducing an amplitude level difference in the detected envelope, and

wherein said step of determining dividing positions determines the dividing positions of the original waveform data on the basis of differentiation of the envelope having been processed by said amplitude conversion step.

Claim 5 (original) A waveform data analysis method as claimed in claim 3 wherein said step of determining dividing positions includes a step of detecting peak levels corresponding to the determined dividing positions.

Claim 6 (original) A waveform data analysis method as claimed in claim 3 which further comprises a step of setting a time difference (Td) between a reproduction start time point of the original waveform data and a start time point of a given dividing position of the original waveform data as

$$Td = n(Ts + Tt) - Tt,$$

where Ts represents an original time difference between a reproduction start position of the original waveform data and a start position of the given dividing position, Tt represents an original time difference between the given dividing position and a peak position where a peak level corresponding to the given dividing position occurs, and n represents an expansion/compression ratio of a reproducing tempo at which the original waveform data are to be reproduced.

Claim 7 (original) A waveform data analysis method as claimed in claim 6 which further comprises:

a step of starting reproduction of the original waveform data at the reproduction start position; and

a step of starting reproduction of the original waveform data at and after the given dividing position upon passage of the set time difference (Td) after the reproduction of the original waveform data is started.

Claim 8 (original) A computer program comprising computer program code means for performing all the steps of claim 1 when said program is run on a computer.

Claim 9 (original) A computer program comprising computer program code means for performing all the steps of claim 3 when said program is run on a computer.

Claim 10 (previously presented) A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

designate a waveform type from among a plurality of waveform types, wherein said plurality of waveform types include at least a sustain-sound-related waveform type and a percussion-sound-related waveform type;

select, in accordance with the designated waveform type, a parameter to be used for a filter process;

read out an original waveform data from said storage device and perform a filter process for removing, from the read out original waveform data, a predetermined frequency component, wherein said filter process is performed using the selected parameter; and

determine dividing positions of the original waveform data on the basis of envelope levels of the waveform data having been subjected to said filter process.

Claim 11 (original) A waveform data analysis apparatus as claimed in claim 10 wherein said processor is further adapted to store, in said storage device, data indicative of the determined dividing positions, and said processor makes available the data indicative of the dividing positions when the original waveform data stored in said storage device are to be reproduced.

Claim 12 (previously presented) A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

read out the original waveform data from said storage device and perform a filter process for removing components of a predetermined frequency band from the original waveform data;

detect an envelope of the waveform data having been subjected to the filter process;

perform an amplitude conversion process on the envelope for reducing an amplitude difference in the envelope; and

determine dividing positions of the original waveform data on the basis of a differentiated result of the envelope having been subjected to the amplitude conversion process.

Claim 13 (previously presented) A waveform data analysis method comprising:

a step of identifying sections of an original waveform data as containing presumed beat positions;

a step of detecting one or more rise positions in each of the identified sections of the original waveform data; and

a step of, when a plurality of rise positions have been detected in a specific one of the identified sections by said step of detecting, selecting one of the detected rise positions and extracting the selected rise position as a dividing position corresponding to one of the presumed beat positions in the specific section of the original waveform data, and, when only one rise position has been detected in another specific one of the identified sections by said step of detecting, extracting the detected one rise position as a dividing position corresponding to one of the presumed beat positions in the other specific section of the original waveform data.

Claim 14 (previously presented) A waveform data analysis method as claimed in claim 13 wherein a plurality of predetermined sections are provided in the original waveform data at equal intervals.

Claim 15 (previously presented) A waveform data analysis method as claimed in claim 13 wherein a plurality of predetermined sections are provided in the original waveform data in correspondence with a rhythm with which the original waveform data were recorded.

Claim 16 (previously presented) A waveform data analysis method as claimed in claim 13 wherein a plurality of the predetermined sections are provided in the original waveform data, and

wherein said step of extracting includes a first extraction step of, for each of the identified sections, extracting the rise position as the dividing position on condition that level values corresponding to the rise position belonging to the section exceed a predetermined first threshold value.

Claim 17 (previously presented) A waveform data analysis method as claimed in claim 16 wherein said step of extracting includes a second extraction step of, for any of the predetermined sections where no rise position was extracted by said first extraction step, extracting the rise position as the dividing position on condition that corresponding level values exceed a second threshold value smaller than said first threshold value.

Claim 18 (previously presented) A waveform data analysis method comprising:

a step of detecting a plurality of rise positions in an original waveform data;

a step of determining a presumed beat positions in the original waveform data;

a step of allocating a plurality of predetermined sections based upon the presumed beat positions in the original waveform data;

a step of selecting, from among the plurality of rise positions detected by said step of detecting, one or more rise positions within each of the predetermined sections; and

a step of, when a plurality of rise positions have been selected in a specific one of the predetermined sections by said step of selecting, further selecting one of the selected rise positions and extracting the further selected rise position as a dividing position corresponding to one of the presumed beat positions in the specific section of the original waveform data, and, when only one rise position has been selected in another specific one of the predetermined sections by said step of selecting, extracting the selected one rise position as a dividing position corresponding to one of the presumed beat positions in the other specific section of the original waveform data.

Claim 19 (previously presented) A waveform data analysis method as claimed in claim 18 wherein the plurality of the predetermined sections are provided in the original waveform data at equal intervals.

Claim 20 (previously presented) A waveform data analysis method as claimed in claim 18 wherein the plurality of the predetermined sections are provided in the original waveform data in correspondence with a rhythm with which the original waveform data were recorded.

Claim 21 (previously presented) A waveform data analysis method as claimed in claim 18 wherein said step of extracting includes a first extraction step of, for each of the predetermined sections extracting the rise position as the dividing position on condition that level values corresponding to the rise position belonging to the predetermined section exceed a predetermined first threshold value.

Claim 22 (previously presented) A waveform data analysis method as claimed in claim 21 wherein said step of extracting includes a second extraction step of, for any of the predetermined sections where no rise position was extracted by said first extraction step, extracting the rise position as the dividing position on condition that corresponding level values exceed a second threshold value smaller than said first threshold value.

Claim 23 (original) A computer program comprising computer program code means for performing all the steps of claim 13 when said program is run on a computer.

Claim 24 (original) A computer program comprising computer program code means for performing all the steps of claim 18 when said program is run on a computer.

Claim 25 (previously presented) A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

identify sections of an original waveform data as containing presumed beat positions;

detect one or more of rise positions in each of the identified sections of the original waveform data; and

when a plurality of rise positions have been detected in a specific one of the identified sections, select one of the detected rise positions and extract the selected rise position as a dividing position corresponding to one of the presumed beat positions in the specific section of the original waveform data, and, when only one rise position has been detected in another specific one of the identified sections, extract the detected one rise position as a dividing position corresponding to one of the presumed beat positions in the other specific section of the original waveform data.

Claim 26 (previously presented) A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

detect a plurality of rise positions in an original waveform data;

determine a presumed beat position in the original waveform data;

allocate a plurality of predetermined sections based upon the presumed beat positions in the original waveform data;

select, from among the detected plurality of rise positions, one or more rise positions within each of the predetermined sections; and

when a plurality of rise positions have been selected in a specific one of the predetermined sections, further select one of the selected rise positions and extract the further selected rise position as a dividing position corresponding to one of the presumed beat positions in the specific section of the original waveform data, and, when only one rise position has been selected in another specific one of the predetermined sections, extract the selected one rise position as a dividing position corresponding to one of the presumed beat positions in the other specific section of the original waveform data.

Claim 27 (previously presented) A waveform data analysis method comprising:

a step of generating a tempo clock;

a step of reproducing automatic performance information synchronously with the tempo clock;

a step of generating a sound based on the reproduced performance information, wherein a musician can execute a musical performance to generate a waveform in conjunction with the generated sound;

a step of receiving the waveform and converting the received waveform into waveform data synchronously with the generated sound;

a step of storing the waveform data in parallel with reproduction of the automatic performance information; and

a step of recording synchronization control data indicative of successive timing relationship between the automatic performance information reproduced successively and the waveform data stored successively, in correspondence with storage of the waveform data, so that the stored waveform data can be associated with timing data of the automatic performance information.

Claim 28 (original) A waveform data analysis method as claimed in claim 27 which further comprises:

a step of detecting envelope levels of the waveform data; and

a step of determining dividing positions of the waveform data on the basis of the synchronization control data and the envelope levels detected by said step of detecting envelope levels.

Claim 29 (original) A waveform data analysis method as claimed in claim 28 wherein said step of determining dividing positions includes:

a step of determining presumed dividing positions of the waveform data on the basis of the automatic performance information and the synchronization control data;

a step of detecting rise positions in the waveform data within predetermined ranges corresponding to the presumed dividing positions; and

a step of extracting any of the rise positions, detected by said step of detecting rise positions, as a dividing position of the waveform data.

Claim 30 (original) A waveform data analysis method as claimed in claim 29 wherein said step of determining presumed dividing positions determines the presumed dividing positions of the waveform data on the basis of beat timing, note-on timing or note-off timing of the automatic performance information.

Claim 31 (original) A waveform data analysis method as claimed in claim 29 wherein said step of extracting any of the rise positions as the dividing positions on the basis of characteristics of the detected rise positions.

Claim 32 (original) A waveform data analysis method as claimed in claim 27 which further comprises:

a step of determining presumed beat positions on the basis of the automatic performance information and the synchronization control data; and

a step of determining dividing positions of the waveform data on the basis of the presumed beat positions.

Claim 33 (original) A waveform data analysis method as claimed in claim 27 which further comprises:

a step of determining presumed beat positions on the basis of note-on timing of the automatic performance information and the synchronization control data; and

a step of determining dividing positions of the waveform data on the basis of the presumed beat positions.

Claim 34 (original) A waveform data analysis method as claimed in claim 27 which further comprises:

a step of determining presumed beat positions on the basis of the automatic performance information and the synchronization control data;

a step of analyzing portions of the waveform data near the presumed beat positions; and

a step of determining dividing positions in a whole of the waveform data on the basis of a result of analysis by said step of analyzing.

Claim 35 (original) A waveform data analysis method as claimed in claim 34 wherein said step of analyzing detects rise positions by analyzing an envelope of the waveform data.

Claim 36 (original) A waveform data analysis method as claimed in claim 34 wherein said step of determining dividing positions determines one dividing position for each of the presumed beat positions on the basis of a plurality of the rise positions included in the result of analysis by said step of analyzing.

Claim 37 (original) A waveform data analysis method as claimed in claim 27 wherein tempo clocks of the automatic performance information and sampling cycles of the waveform data are synchronized with each other, and the synchronization control data include timing data indicative of timing for starting storage of the waveform data.

Claim 38 (original) A waveform data analysis method as claimed in claim 27 wherein the synchronization control data include timing data indicative of timing for starting storage of the waveform data, and synchronization data to synchronize tempo clocks of the automatic performance information and sampling cycles of the waveform data.

Claim 39 (original) A computer program comprising computer program code means for performing all the steps of claim 27 when said program is run on a computer.

Claim 40 (previously presented) A waveform data analysis apparatus comprising:

a clock generator that generates a tempo clock;

a storage device;

a reproduction device that reproduces automatic performance information synchronously with the tempo clock;

a sound generator that generates a sound based on the reproduced performance information. wherein a musician can execute a musical performance to generate a waveform in conjunction with the generated sound;

an input device that receives the waveform and converts the.

received waveform into waveform data synchronously with the generated sound; and

a control device coupled with said storage device, said reproduction device and said input device, said control device being adapted to:

store the waveform data in said storage device in parallel with reproduction of the automatic performance information, and perform control to record, in said storage device, synchronization control data indicative of successive timing relationship between the automatic performance information reproduced successively and the waveform data stored successively, in correspondence with storage of the waveform data, so that the stored waveform data can be associated with timing data of the automatic performance information.

Claim 41 (previously presented) A waveform data processing method comprising:

a step of dividing original waveform data into a plurality of partial waveform data;

a step of detecting a rise time of each of the partial waveform data;

a step of adding waveform data of an additional section to each of the partial waveform data divided from the original waveform data by said step of dividing, the waveform data of the additional section attenuating, with passage of time, from an initial value equal to an envelope level at an end of a corresponding one of the partial waveform data;

a step of storing, in a memory, each of the partial waveform data having the waveform data of the additional section added thereto; and

a step of storing, in the memory, the rise times of the partial waveform data in association with the partial waveform data having the waveform data of the additional section added thereto.

Claim 42 (previously presented) A waveform data processing method as claimed in claim 41, further comprises a step of detecting an attenuation rate of the original waveform data in the selected section, wherein the waveform data of the additional section are imparted with attenuation characteristics based on the attenuation rate detected by said step of detecting.

Claim 43 (previously presented) A waveform data processing method comprising:

a step of dividing original waveform data into a plurality of sections;

a step of, in correspondence with the sections divided from the original waveform data by said step of dividing, previously generating and storing waveform data of additional sections to be added to individual ones of the divided sections;

a step of modifying reproduction start timing of the waveform data of individual ones of the divided sections, which is determined by dividing positions of the original waveform data and a reproducing tempo of the waveform data, in accordance with respective rise times of the waveform data and thereby generating the modified reproduction start timing;

a step of reading out the waveform data of each of the divided sections at the modified reproduction timing and thereby performing waveform reproduction, wherein, when a reproducing tempo for reproduction of the waveform data is faster than a predetermined standard, said step of reading performs the waveform reproduction using the original waveform data of the individual divided sections without using the waveform data of the additional sections; and

a step of reading out the waveform data of each of the divided sections at the modified reproduction timing and thereby performing waveform reproduction, wherein, when the reproducing tempo is slower than the predetermined standard, said step of reading performs the waveform reproduction by adding the waveform data of corresponding ones of the additional sections to the divided sections to follow the waveform data of the divided sections.

Claim 44 (original) A waveform data processing method as claimed in claim 43 wherein the predetermined standard is an original tempo of the original waveform data.

Claim 45 (original) A computer program comprising computer program code means for performing all the steps of claim 41 when said program is run on a computer.

Claim 46 (original) A computer program comprising computer program code means for performing all the steps of claim 43 when said program is run on a computer.

Claim 47 (previously presented) A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

divide original waveform data into a plurality of partial waveform data;

detect a rise time of each of the partial waveform data;

add waveform data of an additional section to each of the partial waveform data, the waveform data of the additional section attenuating, with passage of time, from an initial value equal to an envelope level at an end of a corresponding one of the partial waveform data;

store, in a memory, each of the partial waveform data having the waveform data of the additional section added thereto; and

store, in the memory, the rise times of the partial waveform data in association with the partial waveform data having the waveform data of the additional section added thereto.

Claim 48 (previously presented) A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

divide original waveform data into a plurality of sections;

in correspondence with the divided sections, previously generate and store waveform data of additional sections to be added to individual ones of the divided sections;

modify reproduction start timing of the waveform data of individual ones of the divided sections, which is determined by dividing positions of the original waveform data and a reproducing tempo of the waveform data, in accordance with respective rise times of the waveform data and thereby generating the modified reproduction start timing;

read out the waveform data of each of the divided sections at the modified reproduction timing thereby to perform waveform reproduction, wherein, when a reproducing tempo for reproduction of the waveform data is faster than a predetermined standard, said waveform reproduction is performed using the original waveform data of the individual divided sections without using the waveform data of the additional sections; and

read out the waveform data of each of the divided sections at the modified reproduction timing thereby to perform waveform reproduction, wherein, when the reproducing tempo is slower than the predetermined standard, said waveform reproduction is performed by adding the waveform data of corresponding ones of the additional sections to the divided sections to follow the waveform data of the divided sections.

Claim 49 (canceled)

Claim 50 (previously presented) A waveform data analysis method as claimed in claim 27, wherein said step of recording records a sample number as the synchronization control data, every predetermined number of the tempo clock, in parallel with reproduction of the automatic performance information.

Claim 51 (previously presented) A waveform data analysis method as claimed in claim 27, wherein said step of recording records a sample number as the synchronization control data, at each beat timing of the reproduced automatic performance information.

Claim 52 (previously presented) A waveform data analysis method as claimed in claim 27, wherein said step of recording records a sequence position of the automatic performance information, every predetermined number of the waveform data samples, in parallel with reproduction of the automatic performance information.

Claim 53 (previously presented) A waveform data processing method as claimed in claim 41, which further comprises:

a step of, when a reproducing tempo for reproduction of a waveform is faster than a predetermined standard, using each of the partial waveform data divided by said step of dividing to reproduce a waveform without using the waveform data of the additional sections; and

a step of, when the reproducing tempo for reproduction of a waveform is slower than the predetermined standard, using the partial waveform data stored in said memory to reproduce a waveform comprising the partial waveform data each having the waveform data of the additional section added thereto.

Claim 54 (previously presented) A waveform data processing method for reproducing original waveform data in which dividing positions for dividing the original waveform data into a plurality of sections and peak positions where peak levels appear in individual ones of the sections are known previously, said waveform data processing method comprising:

a step of starting reproduction of the original waveform data; and

a step of, upon passage of a time of [n (Ts+Tt) - Tt] after the start of reproduction of the original waveform data, starting the original performance data following a given one of the dividing positions, where Ts represents a start time length from a start position of the original waveform data to the given dividing position, Tt represents a rising time from the given dividing position to a corresponding peak position and n represents an expansion/contraction rate of a tempo during the reproduction of the original waveform data.

Claim 55 (previously presented) A computer program comprising computer program code means for performing all the steps of claim 54 when said program is run on a computer.

Claim 56 (previously presented) A waveform data processing apparatus for reproducing original waveform data in which dividing positions for dividing the original waveform data into a plurality of sections and peak positions where peak levels appear in individual ones of the sections are known previously, said waveform data processing apparatus comprising:

a reproducing section for starting reproduction of the original waveform data; and

a processor section coupled with the reproducing section for, upon passage of a time of [n (Ts+Tt) - Tt] after the start of reproduction of the original waveform data, starting the original performance data following a given one of the dividing positions, where Ts represents a start time length from a start position of the original waveform data to the given dividing position, Tt represents a rising time from the given dividing position to a corresponding peak position and n represents an expansion/contraction rate of a tempo during the reproduction of the original waveform data.

57 (new) A waveform data analysis method as claimed in claim 13, wherein, when the plurality of rise positions have been detected in the specific one of the identified sections, said step of selecting analyzes a characteristic of each of the plurality of rise positions detected by said step of detecting and selects said one of the detected rise positions on the basis of the analyzed characteristic of each of the rise positions.

58 (new) A waveform data analysis method as claimed in claim 18, wherein, when the plurality of rise positions have been selected in the specific one of the predetermined sections, said step of further selecting analyzes a characteristic of each of the rise positions selected by said step of selecting and further selects said one of the selected rise positions on the basis of the analyzed characteristic of the rise positions.

59 (new) A waveform data analysis apparatus as claimed in claim 25, wherein, when the plurality of rise positions have been detected in the specific one of the identified sections, said processor analyzes a characteristic of each of the detected rise positions and selects said one of the detected rise positions on the basis of the analyzed characteristic of each of the rise positions.

60 (new) A waveform data analysis apparatus as claimed in claim 26, wherein, when the plurality of rise positions have been selected in the specific one of the predetermined sections, said processor analyzes a characteristic of the selected rise positions and further selects said one of the selected rise positions on the basis of the analyzed characteristic of the selected rise positions.